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# Forest Research Notes

## **N**ortheastern Forest

FOREST SERVICE, U.S. DEPT. OF AGRICULTURE, 102 MOTORS AVENUE, UPPER DARBY, PA.

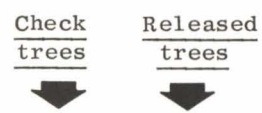
## **E**xperiment Station

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### RELEASE, BROWSE DAMAGE, AND GROWTH OF YOUNG WHITE PINES

Exactly what happens to young white pine seedlings that have been released from hardwood competition and allowed to grow, subject to browse damage, for a 7-year period? Some indications of the results of such treatment can be seen from recent work on the Massabesic Experimental Forest in Maine.

A study of the effect of hardwood competition on white pine was started in 1952 and ended in 1958. Four-year-old white pine seedlings were released by cutting all other trees and shrubs closer to the pine than a distance equal to their height. This release was maintained for the first 3 years. Briefly, results can be summed up this way:



The study provided ... 60 and 60.  
But the identity of ... 11 and 3 ...was lost by 1958.  
So this left ..... 49 and 57 ...for the study.  
Browsing damage to .... 27 and 18 ...was severe.  
In fact, ..... 16 and 7 ...died as the result.  
By 1958, only ..... 6 and 13 ...were not damaged.  
Consequently, only .... 22 and 39 ...were available for

comparison of growth after release (and two-thirds of these had some browse damage). During the study period, most of the hardwoods around seven of the check trees were killed by scale insects. This released these pines from their former competitors. In addition, one released tree was partially broken at the ground line by snow.

When the broken tree is eliminated, and the 22 check trees are separated into two groups, the 15 remaining over-topped and the 7 naturally released, the following growth comparisons are possible:

|   | <u>Over-<br/>topped<br/>check<br/>trees</u> | <u>Free-<br/>to-grow<br/>check<br/>trees</u> | <u>Released<br/>trees<br/>(1952-54)</u> |
|---|---|--|---|
|   | ↓   | ↓  | ↓                                       |
| For the .....                                       | 15  | 7  | and 38 trees:                           |
| Average annual height growth was .....              | 7.7   | 10.7   | and 8.9 inches, 1952-1954               |
| Average annual height growth was .....              | 5.2   | 9.3  | and 11.7 inches, 1955-1958              |
| Average total height growth was .....               | 44  | 69   | and 74 inches for 7 years.              |
| Average annual diameter growth <sup>1</sup> was ... | .06   | .11  | and .12 inches, 1952-1954.              |
| Average annual diameter growth was ....             | .06   | .16  | and .23 inches, 1955-1958.              |
| Average total diameter growth was ....              | .4  | 1.0  | and 1.3 inches for 7 years.             |

It has been generally accepted that young white pine respond to release. This study shows that, in addition, released trees are better able to recover after severe browsing. Some trees become released naturally, but in this study only one-third of the trees were so released in 6 years. In summary, when pine stocking is light and there is hardwood competition, with strong possibilities of browse damage, release is desirable to maintain a good proportion of the species as well as to increase growth rate.

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<sup>1</sup>Diameter growth was measured about an inch from the ground.